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U.S. ARMY LOGISTICS

SUSTAINING AMERICA'S ARMY: THE STRENGTH OF THE NATION

AMERICA'S ARMY: THE STRENGTH OF THE NATION™

Army Corrosion Program Update

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Agenda

- ❑ Department of the Army G-4 Vision and Mission
- ❑ Roles and Responsibilities of DA G-4 Related to Corrosion
- ❑ Army Corrosion Structure
- ❑ Army Corrosion Partners
- ❑ Army Initiatives to Combat Corrosion
- ❑ Challenges
- ❑ Way Ahead



Department of the Army G-4

Vision

Enable a ready Army by providing and overseeing integrated logistics policies, programs, and plans in support of Army Force Generation.

Mission

Recognized as the preeminent source on the Army Staff for relevant, value-added logistics expertise. Actively engaged in sustaining, preparing, resetting, and transforming the Nation's Army in support of full spectrum operations.



Roles and Responsibilities of DA G-4 Related to Corrosion

- ❑ Army proponent for AR 750-59
 - Establish equipment maintenance corrosion policy

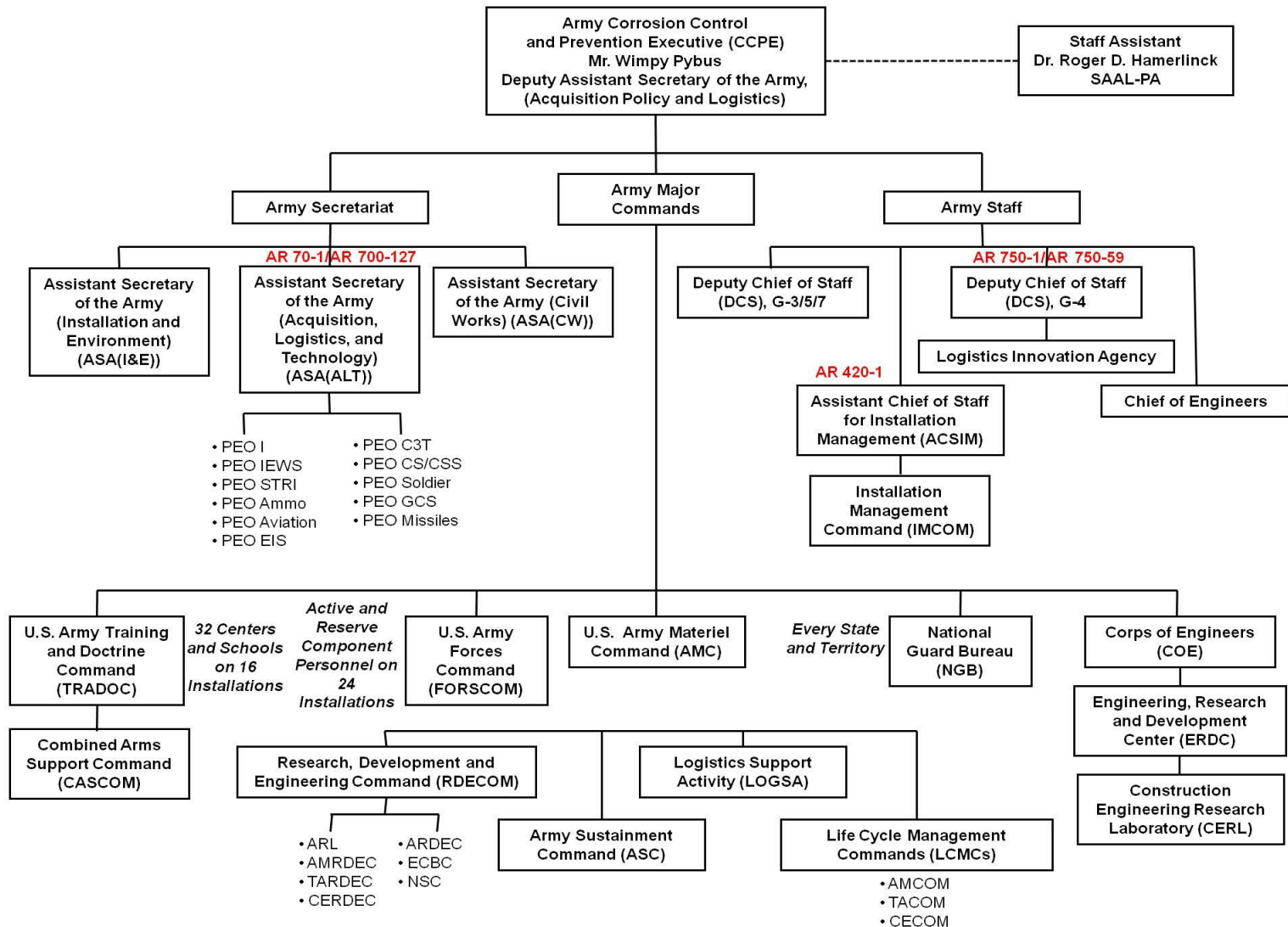
- ❑ Advises the Army Corrosion Control and Prevention Executive (CCPE) on maintenance and supply policy and procedures

- ❑ Co-chair of the Sustaining PEG
 - Validate and provide resources to sustain Army corrosion efforts

- ❑ Develop, support and defend resources to initiate and sustain an effective corrosion program

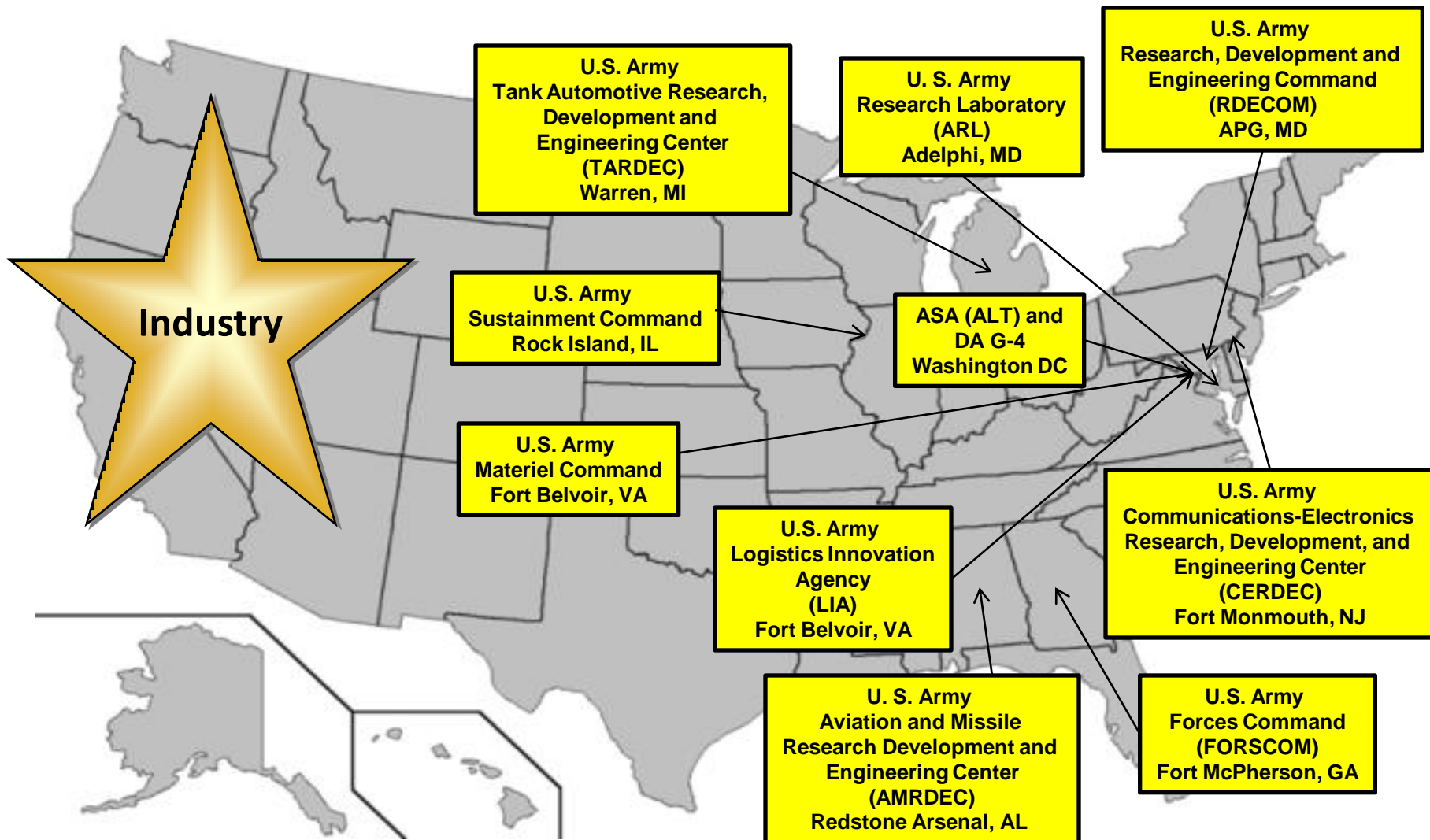


Army Corrosion Structure





Army Corrosion Partners





Army Initiatives to Combat Corrosion

Focus:

Identification and rapid transfer of new technology and maintenance processes that can be applied throughout a systems lifecycle to inhibit corrosion.

- ❑ Anti-Corrosion Nanotechnology Solutions for Logistics (ACNS-L) Project – LIA
- ❑ Chromate-Based Coating Products – RDECOM
- ❑ Integrated Teflon Like Coatings – RDECOM



Anti-Corrosion Nanotechnology Solutions for Logistics (ACNS-L) Project

- ❑ Nanotechnology - Measure, manipulate and manufacture materials and devices at the scale of atoms and molecules (1 to 100 nanometers).
- ❑ Structured Approach Toward Applying Existing/Emerging “Nanotech” Solutions.
- ❑ Potential Applications for Ground and Aviation Vehicles



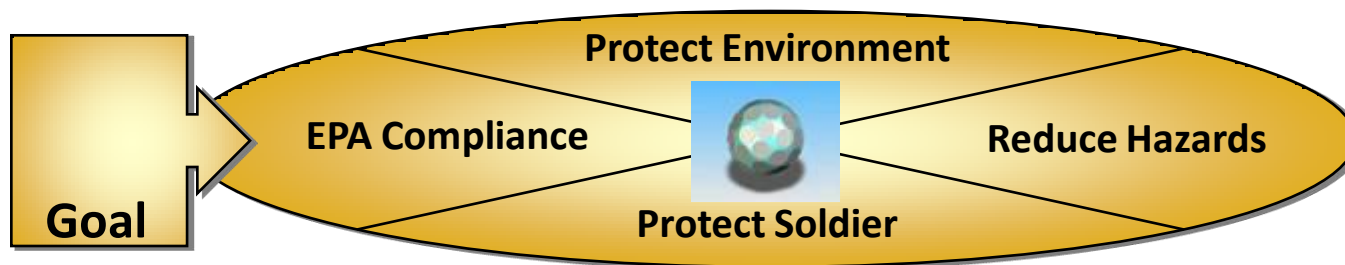
OH-58D
Torquemeter Support
Testing
FY11





Chromate-Based Coating Products

- ❑ Chromate-based pretreatments have provided outstanding corrosion inhibition in the past, but new EPA and OSHA requirements are drastically reducing the use of Cr^{6+} .
- ❑ Develop chromate free pretreatments to enhance corrosion protection and adhesion promotion on light weight alloys.





Integrated Teflon Like Coatings

- ❑ Develop coatings for the protection of metal surfaces against thermal, chemical and biological damage.

- ❑ Warfighter Payoff
 - Self-cleaning for reduced contamination
 - Decrease life-cycle costs
 - Reduce weapon system corrosion, maintenance, operational & liability costs
 - Reduce potential bio & chem hazards



Challenges

- ☐ Increase visibility of corrosion costs
- ☐ Standardize corrosion infrastructure
- ☐ Lab to field transfer velocity

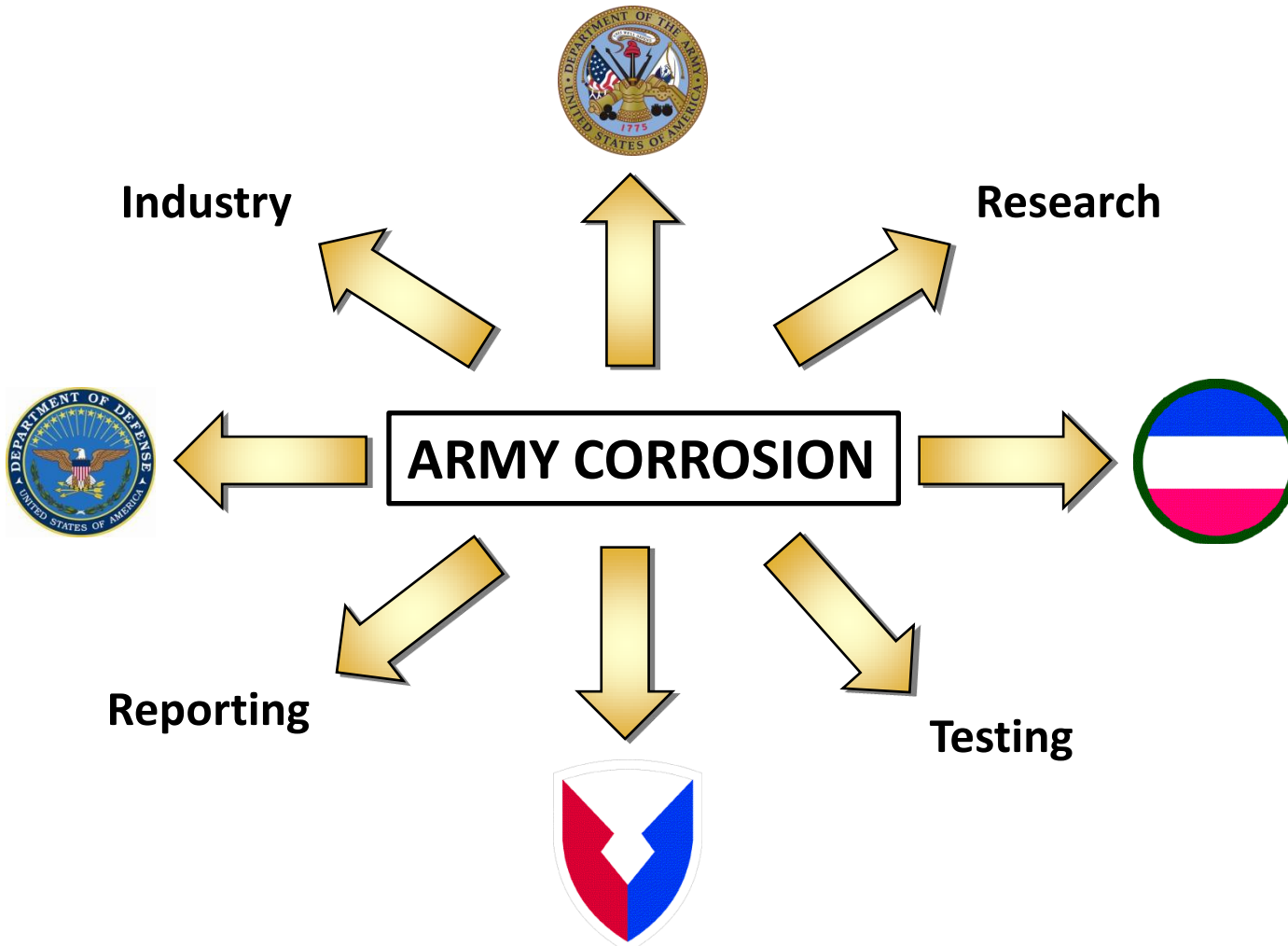


Tracking of Corrosion Related Maintenance

- ❑ In the 2009 Annual Cost of Corrosion for Army Ground Vehicles Report, LMI used a list of 433 keywords to search for corrosion related repairs. IE: Check, eval, test, crack, leak, weld, clean
 - DA G4 published guidance directing the use of one failure code
 - Failure Code 170 – when corrosion is the root-cause for failure or required maintenance.
 - Mapping corrosion related maintenance actions to Global Combat Support System-Army and Logistics Modernization Program to ensure visibility is enhanced.



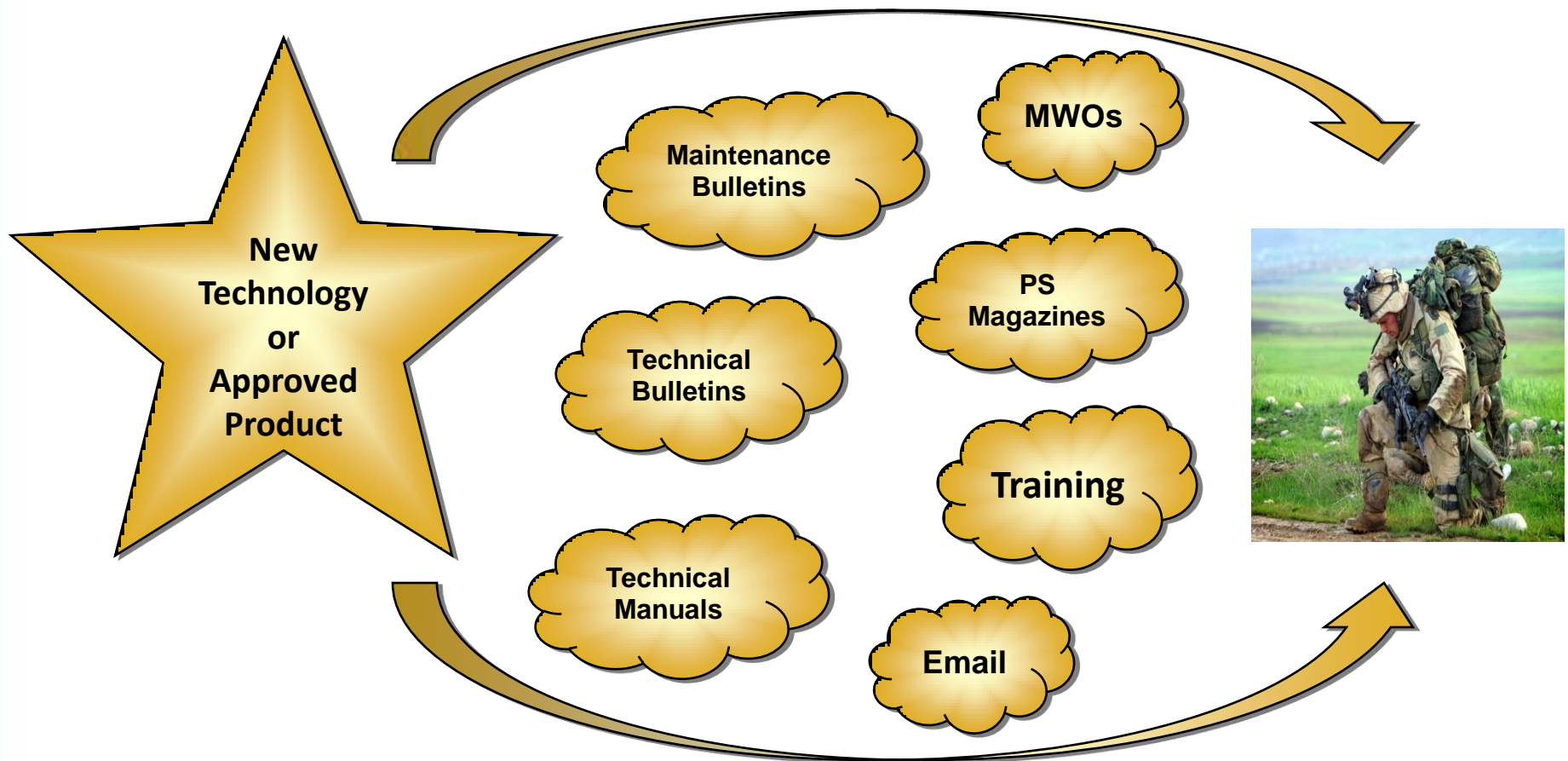
Current Strategy



Bottom Line: Current efforts to develop a corrosion strategy enables unity of effort.



Lab to Field Transfer



Bottom Line: Increasing velocity of information transfer is critical to effectively combat corrosion!



Thoughts on Way Ahead

- ❑ IAW guidance from the CCPE, establish an Army Corrosion Board (ACB)
 - The ACB will be responsible for the coordinated development of an Army-wide strategy for corrosion control and prevention.
- ❑ Develop and publish Army corrosion strategy
- ❑ Establish resource requirements within POM 12-17
- ❑ Revise and publish AR 750-59 to better define:
 - Roles and responsibilities
 - Tactical equipment policy
 - Guidance to increase velocity for the adoption of new technology



Questions?



Back-up Slides



ACNS-L Project Objectives

- ❑ Increasing U.S. Army awareness about the potential of nanotechnology for corrosive resistant materials.
- ❑ Facilitating enhanced communication and collaboration through organized information exchange within the U.S. Army.
- ❑ Assessing the technical, business, and risk elements of implementing an anti-corrosion nanotechnology solution for the OH-58D Kiowa Warrior.
- ❑ Developing a comprehensive OH-58D KW ACNS-L Nano-tech Corrosion Mitigation Plan (NCMP) with actionable recommendations for implementing an anti-corrosion nanotech solution.
- ❑ Developing a High-level sub-topic matrix report that provides potential nanotechnology solutions for ten (10) additional U.S. Army "Platforms of Interest" as a foundation for future U.S. Army CPC activities.



Nanotechnology-Enabled Self Healing Anti-Corrosion Coating Products

☐ Milestones/Schedule:

- Formulate pretreatment for Mg and Ti 3QFY10
- Deposit optimized pretreatment on substrates 3QFY10
- Demonstrate compatibility with conventional organic coating processes (powder, liquid, and e-coat) 4QFY10
- Define process parameters for scale-up 4QFY10
- Conduct adhesion tests 4QFY10
- Conduct corrosion resistance tests to determine self-healing capabilities 1QFY11
- Demonstrate application techniques to facilitate scale-up and manufacturability 1QFY11



Annual Cost of Corrosion for Army Ground Vehicles

- ❑ It is estimated that Army ground vehicle corrosion costs the Army \$2.44* billion per year.
 - This equates to roughly 14 percent of our annual maintenance budget.

- ❑ The highest corrosion-related costs are incurred during depot maintenance, which is more than 40 percent of the total corrosion cost for Army ground vehicles.
 - Corrosion costs incurred as part of ground vehicle depot maintenance are nearly triple those of field-level maintenance.

* Report MEC8T1T1 – The Annual Cost of Corrosion for Army Ground Vehicles - LMI



Annual Cost of Corrosion for Army Aviation and Missile Equipment

- ❑ It is estimated that Army aviation and missile equipment corrosion costs the Army \$1.6* billion per year.
 - This equates to roughly 15.8 percent of the total Field level maintenance costs for aviation and missile equipment.
- ❑ The Army spent more than twice as much on corrective corrosion maintenance for aviation and missile equipment (\$1.017 billion) as it did on preventive corrosion maintenance (\$503 million) for the same equipment.

*Report SKT50T3 – The Annual Cost of Corrosion for Army Aviation and Missile Equipment Vehicles – LMI